EXPLANATION OF SIGNIFICANT DIFFERENCES FOR THE 100 AREA REMAINING SITES INTERIM REMEDIAL ACTION RECORD OF DECISION

February 2004

USDOE Hanford 100 Area
100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units
Hanford Site
Benton County, Washington

INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

The 100 Area of the Hanford Site contains nine inactive nuclear reactors and numerous associated facilities and waste sites. Remediation of the 100 Area is being conducted under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) in accordance with several Records of Decision (RODs), one of which is the 100 Area remaining sites interim remedial action ROD (EPA 1999). The U.S. Environmental Protection Agency (EPA – the lead regulatory agency), Washington State Department of Ecology (Ecology – the support regulatory agency), and U.S. Department of Energy (DOE – the responsible agency), hereafter referred to as the Tri-Parties, are issuing this Explanation of Significant Differences (ESD) to provide notice of three significant changes to the 100 Area remaining sites interim remedial action ROD (EPA 1999). These changes are:

1. Add 28 waste sites.

2. Add 10 *Code of Federal Regulation* (CFR) 1022 and 40 CFR Part 6, Appendix A as applicable or relevant and appropriate requirements (ARARs).

3. Revise the annual institutional controls report submittal date to be consistent with the requirements contained in the Hanford sitewide institutional controls report, titled *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions* (DOE-RL 2001).

The basis for these significant changes is summarized below. Since the issuance of the ROD, ongoing remedial activities in the 100 Areas have identified 28 newly discovered waste sites that have a potentially unacceptable risk to human health and the environment. In accordance with the ROD, publication of an ESD is required to add newly discovered waste sites.

Four of the 28 waste sites are within the Columbia River floodplain; therefore, the ARARs10 CFR 1022 and 40 CFR Part 6, Appendix A for floodplains are added to the ROD.

EPA's 5-year ROD review conducted in 2001 recommended the use of an ESD to change the institutional control reporting requirements.

Additionally, there are two clarifications to the ROD, which do not require issuance of an ESD, but are included in this ESD. These are:

1. Clarify that when any new waste sites are discovered, in areas where remediaton activities are being conducted pursuant to the ROD, remedial actions on the new waste site(s) could take place before the ESD is approved in circumstances when the waste site characteristics

qualify for the plug-in approach of the selected remedy of remove/treat/dispose (RTD). In such circumstances, an ESD will be issued as soon as practicable to notify the public of the additional waste site(s) to be addressed under the ROD.

2. Clarify that waste disposal at the Environmental Restoration Disposal Facility (ERDF) shall comply with the revision of the ERDF waste acceptance criteria (BHI 2003) in effect at the time of disposal.

Statutory Citation for an Explanation of Significant Difference

The Tri-Parties are issuing this ESD in accordance with Section 117(c) of CERCLA and Section 300.435(c)(2)(i) of the "National Oil and Hazardous Substances Pollution Contingency Plan" (National Contingency Plan) (40 CFR 300). The purpose of this ESD is to provide public notice of the changes identified above. This ESD will become part of the Administrative Record for the Hanford Site cleanup decision. The Administrative Record is available for review at the following location:

Administrative Record
2440 Stevens Center Place, Room 1101
Richland, Washington 99352
(509) 376-2530

SITE HISTORY, CONTAMINATION, AND SELECTED REMEDY

The 100 Area of the Hanford Site is the location of nine retired plutonium-production reactors and numerous associated facilities. Activities conducted in support of reactor operations resulted in the creation of hundreds of waste sites and contamination of the soil and groundwater. In November 1989, the 100 Area was listed in the National Priorities List under CERCLA. Since then, sampling and remediation activities have been ongoing in the 100 Area, and five interim remedial action RODs, including the 100 Area remaining sites interim remedial action ROD (EPA 1999), have been issued to address cleanup of contaminated soil, structures, and debris. The selected remedy established in the ROD consists of the following components:

- Remove contaminated soil, structures, and associated debris.
- Treat these wastes as required to meet ERDF requirements.
- Dispose of contaminated materials at the ERDF.
- Backfill excavated areas with clean material and revegetate.

BASIS FOR THE DOCUMENT

Since the issuance of the ROD (EPA 1999), ongoing remedial activities in the 100 Areas have identified 28 newly discovered waste sites. These 28 waste sites, addressed in this ESD, have been determined by the Tri-Parties to be potential candidate waste sites for remediation due to

hazardous substances that may be present at concentrations that pose a threat to human health and the environment. The Tri-Parties have determined that these 28 waste sites are similar to the other candidate waste sites listed in Table A-2 of the ROD because they potentially have similar contaminants, similar waste characteristics, and similar contaminated media. This determination is based on historical information and records, as well as analogous data from other similar waste sites. Since these 28 waste sites are similar, as described by the ROD, they are acceptable to be added to Table A-2 of the ROD.

As candidate sites, there is insufficient information to determine if remedial action is required, as well as to determine if no action is warranted. Further historical research and/or field sampling will be required to make such decisions. Should data be obtained showing that these sites contain contaminants that exceed the remedial action objectives, remediation under the selected remedy established in the ROD (i.e., RTD remedy) will proceed if the sites qualify for use of the plug-in approach, as identified in the ROD (EPA 1999). To use the plug-in approach, the ROD requires that the waste sites share common physical and contaminant characteristics with sites where the RTD was previously selected in the ROD. These characteristics were defined in the ROD and consist of similar types of the following:

- Contaminants (e.g., chemical and radiological)
- Contaminated environmental media (e.g., soil)
- Contaminated waste material (e.g., concrete, metal, and wood).

Should the waste site not meet these requirements, no further action could occur until the waste site is added to another cleanup decision document with an appropriate remedy (i.e., another ROD).

DESCRIPTION OF SIGNIFICANT DIFFERENCES

The three significant changes and two clarification items identified above are described in more detailed below.

- **Add 28 Newly Discovered Candidate Waste Sites**

  In 1998, prior to issuance of the ROD (EPA 1999), an extensive effort was conducted to evaluate over 400 waste sites in order to determine which sites would require remedial action and which sites would not require remediation. This effort was performed in order to support development of the ROD. The results were documented in the update to Appendix C of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1998). The sites identified as posing a potential risk (207 out of the 400 waste sites) were evaluated in accordance with the CERCLA process, with remedy selection documented in the ROD. Out of the 207 waste sites, 46 waste sites required remediation and are listed in Table A-1 of the ROD. The remaining 161 waste sites were candidate waste sites, which potentially required remediation, and are listed in Table A-2 of the ROD. Because the 161 candidate waste sites were similar to the 46 sites requiring remediation, they would “plug-in” to the same remedy if a remedial action was warranted. The ROD also

stated that any newly discovered 100 Area waste sites identified after remedy selection that were similar to the 100 Area remaining sites would be "plugged in" to the RTD remedy.

In the five years following the 1998 effort, new information from current remedial activities in the 100 Areas resulted in the identification of the 28 newly discovered waste sites that have a potentially unacceptable risk to human heath and the environment. The Tri-Parties have determined that these 28 waste sites are similar to the other candidate waste sites listed in Table A-2 of the ROD because they potentially have similar contaminants, similar waste characteristics, and similar contaminated media. This determination is based on historical information and records, as well as analogous data from other similar waste sites. The waste sites are located in the 100-B/C, 100-D, 100-F, 100-H, and 100-K Areas of the Hanford Site (Figures 1A through 1G). Attachment 1 of this ESD provides the waste site descriptions and sampling cost estimates.

Of the 28 candidate waste sites listed in Attachment 1 of this ESD, 4 waste sites are associated with the 1706-KE Waste Treatment System treatment, storage, and/or disposal (TSD) unit located in the 100-KR-2 Operable Unit. The Tri-Parties believe that cleanup/closure of the TSD unit waste sites shall be integrated with the CERCLA process. The implementation process for conducting the cleanup/closure activities of these TSD unit waste sites shall be outlined in a future revision of the *Remedial Design Report/Remedial Action Work Plan for the 100 Area* (RDR/RAWP) (DOE-RL 2002). Furthermore, a modification to the Hanford facility *Resource Conservation and Recovery Act* (RCRA) permit (Ecology 1994) shall be performed to incorporate the closure plan for this TSD unit developed in conjunction with the CERCLA process, subject to approval and completion of the modification process. The 100 Area RDR/RAWP shall be revised in order to support Tri-Party Agreement Milestone M-016-52, "Initiate response actions for the remaining sites for the 100 K Area" (Ecology et al. 1998).

- **Add 10 CFR 1022 and 40 CFR Part 6, Appendix A as an Applicable or Relevant and Appropriate Requirement**

  Four of the 100 Area remaining sites are located within the Columbia River floodplain. Remedial actions performed on waste sites in a floodplain must be conducted in a manner that avoids adverse effects, minimizes potential harm, and restores and preserves natural and beneficial values, as required by 10 CFR 1022 and 40 CFR Part 6, Appendix A. This ESD adds these two new ARARs. Addition of these ARARs is not expected to result in any significant changes to the remedial action because the existing ROD already requires backfilling waste sites, revegetating waste sites, protecting cultural and natural resources, following mitigation action plans, revegetation plans, maintaining institutional controls, and following the other required ARARs and regulatory-approved plans, which should satisfy these additional ARARs.

- **Revise the Annual Institutional Controls Report Submittal Date**

  The ROD (EPA 1999) states that a report shall be submitted to EPA and Ecology by March 30 of each year, summarizing the results of an implementation and effectiveness of

institutional controls evaluation for the 100 Area operable units for the preceding calendar year. The *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions* (DOE-RL 2001) was issued following the ROD, and requires submittal of a sitewide institutional controls report to EPA and Ecology by July 2003, and by September 30 each year thereafter. This ESD revises the original ROD reporting date of March 30 to September 30. This change is consistent with EPA's 5-year ROD review conducted in 2001.

- **Clarify the Public Notification Process When New Waste Sites Are Discovered**

  The ROD states that "The Tri-Parties will notify the public regarding the decision to plug in newly discovered sites through the periodic publication of Explanations of Significant Differences" (EPA 1999). The ROD does not specify when to publish the ESD. This ESD clarifies this process so that remediation of newly discovered waste sites may proceed before the ESD is issued when the waste site is in the same 100 Area of ongoing remediation. An ESD would still be required, but this process allows cleanup actions to be implemented at newly discovered waste sites using equipment and personnel already in the field for an existing waste site without prior issuance of an ESD.

- **Clarify the Revision of the ERDF Waste Acceptance Criteria Citation**

  The ROD refers to Revision 3 of the ERDF waste acceptance criteria (EPA 1999). The most recent version of the ERDF waste acceptance criteria is Revision 4, and supplemental waste acceptance criteria are currently included in Change Notice BHI-00139-04-CN-01 (BHI 2003). This change to the ROD clarifies that the applicable version of the ERDF waste acceptance criteria and the ERDF supplemental waste acceptance criteria shall be the revision in effect at the time of waste disposal.

The changes and clarifications identified above do not change the performance of the RTD remedy or the overall schedule for remediation of waste sites currently included in the ROD (EPA 1999). The remediation schedule is not extended by the addition of the newly discovered sites, and remediation will continue to be conducted under the existing milestones. The ESD does not change the existing ARARs identified in the ROD, but adds one additional ARAR.

There would be an increase in the cost of the remedy, which was originally estimated at $56 million. The present-value cost for sampling of the candidate sites listed in Attachment 1 of this ESD is $3,054,500. These costs were estimated using the Microsoft® Excel spreadsheet model used in *Appendix N – Remedy Selection Process for Remaining Source Operable Unit Waste Sites* (DOE-RL 1998). The model was updated to reflect current practices.

It is anticipated that approximately 20% of the candidate sites will require remediation. If remediation of all candidate waste sites is necessary, the additional total estimated cost for remediation is $29 million ($20 million for the pipelines identified in Attachment 1 and $9 million for the other sites, also identified in Attachment 1.)

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Through this ESD, the Tri-Parties authorize the following, as more fully described above:

- Add 28 candidate waste sites to the 100 Area Remaining Sites Interim Remedial Action ROD (EPA 1999) (Attachment 1 of this ESD). Additionally, allow for cleanup/closure of the 1706-KE Waste Treatment System TSD unit waste sites to be integrated with the CERCLA process. The implementation process for conducting the cleanup/closure activities of these TSD unit waste sites shall be outlined in a future revision of the RDR/RAWP (DOE-RL 2002). Furthermore, a modification to the Hanford facility RCRA permit (Ecology 1994) shall be performed to incorporate the closure plan for this TSD unit developed in conjunction with the CERCLA process, subject to Ecology's approval and completion of the modification process. The 100 Area RDR/RAWP shall be revised in order to support Tri-Party Agreement Milestone M-016-52, "Initiate response actions for the remaining sites for the 100 K Area" (Ecology et al. 1998).

- Add 10 CFR 1022 and 40 CFR Part 6, Appendix A as ARARs.

- Change the annual institutional controls report submittal date from March 30 to September 30.

- Clarify that remediation of newly discovered sites may proceed before an ESD is issued in circumstances where the waste site is in the same area of ongoing remediation, and the waste site meets the plug-in requirements of the ROD. In such circumstances, an ESD will be issued, as soon at practicable, to notify the public of the additional waste site(s) to be addressed under the ROD.

- Clarify that waste disposal at the ERDF shall comply with the revision of the ERDF waste acceptance criteria in effect at the time of disposal.

SUPPORT AGENCY COMMENTS

Ecology, as the support agency, concurs with the ESD to the 100 Area remaining sites interim remedial action ROD (EPA 1999).

STATUTORY DETERMINATIONS

This remedy satisfies CERCLA Section 121. The interim action remedy selected in the 100 Area remaining sites interim remedial action ROD (EPA 1999), as modified by this ESD, remains protective of human health and the environment, complies with federal and state requirements identified in the 1999 ROD and in this ESD that are applicable or relevant and appropriate to remedial actions, is cost-effective, and uses permanent solutions and alternative treatment technologies to the maximum extent practicable. In addition, the remedy employs treatment (as appropriate) to meet land disposal restrictions, as well as the ERDF waste acceptance criteria.

The response action as modified and clarified by this ESD and the 100 Area remaining sites interim remedial action ROD (EPA 1999) is necessary to protect the public health, welfare, or environment from actual or threatened releases of hazardous substances into the environment. Such a release or threat of release may present an imminent and substantial endangerment to the public health, welfare, or the environment.

PUBLIC PARTICIPATION COMPLIANCE

The public participation requirements set forth in 40 CFR 300.435(c)(2)(i) of the National Contingency Plan are met through the issuance of this ESD, an associated informational sheet, and through notification to the public via newspaper publications.

REFERENCES

10 CFR 1022, "Compliance With Floodplain/Wetlands Environmental Review Requirements," *Code of Federal Regulations*, as amended.

40 CFR 6, "Procedures for Implementing the Requirements of the Council on Environmental Quality on the National Environmental Policy Act," *Code of Federal Regulations*, as amended.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*, as amended.

BHI, 2003, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, BHI-00139, Change Notice BHI-00139-04-CN-01, Bechtel Hanford, Inc., Richland, Washington.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq.

DOE-RL, 1998, *Appendix N – Remedy Selection Process for Remaining Source Operable Unit Waste Sites*, DOE/RL-94-61, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 2001, *Sitewide Institutional Controls Plan for Hanford CERCLA Response Actions*, DOE/RL-2001-41, Rev. 0, U.S. Department of Energy, Richland, Washington.

DOE-RL, 2002, *Remedial Design Report/Remedial Action Work Plan for the 100 Area*, DOE/-Rl-96-17, Rev. 4, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Ecology, 1994, *Hanford Facility RCRA Permit*, Permit No. WA7890008967, Washington State Department of Ecology, Olympia, Washington.

Ecology, EPA, and DOE, 1998, *Hanford Federal Facility Agreement and Consent Order*, 2 vols, as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Richland, Washington.

EPA, 1999, *Interim Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington*, U.S. Environmental Protection Agency, Region 10, Seattle, Washington.

Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901, et seq.

Figure 1A. Location of the 100 Area Operable Units.

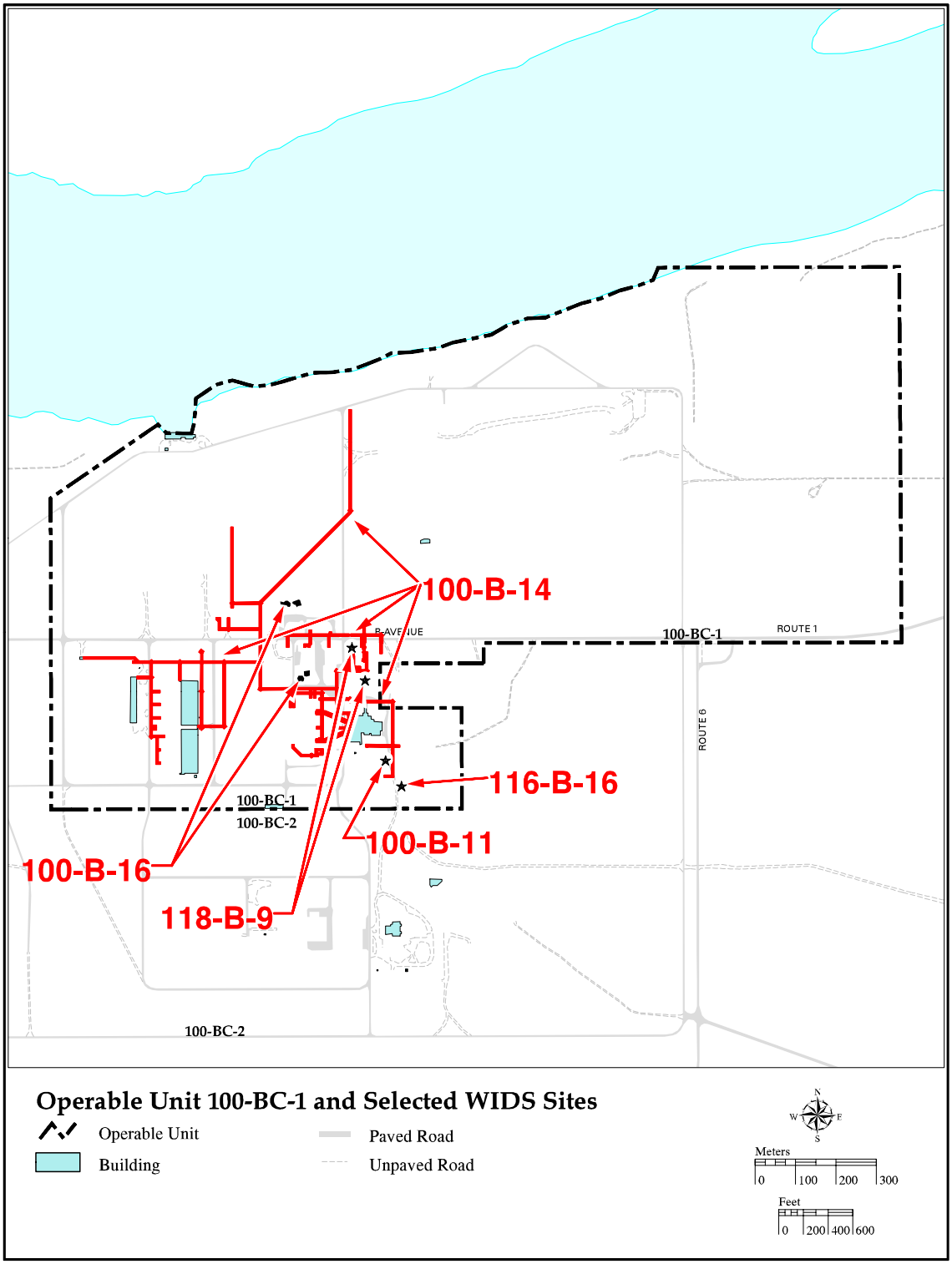

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Figure 1B. Location of the 100 Area Operable Units.

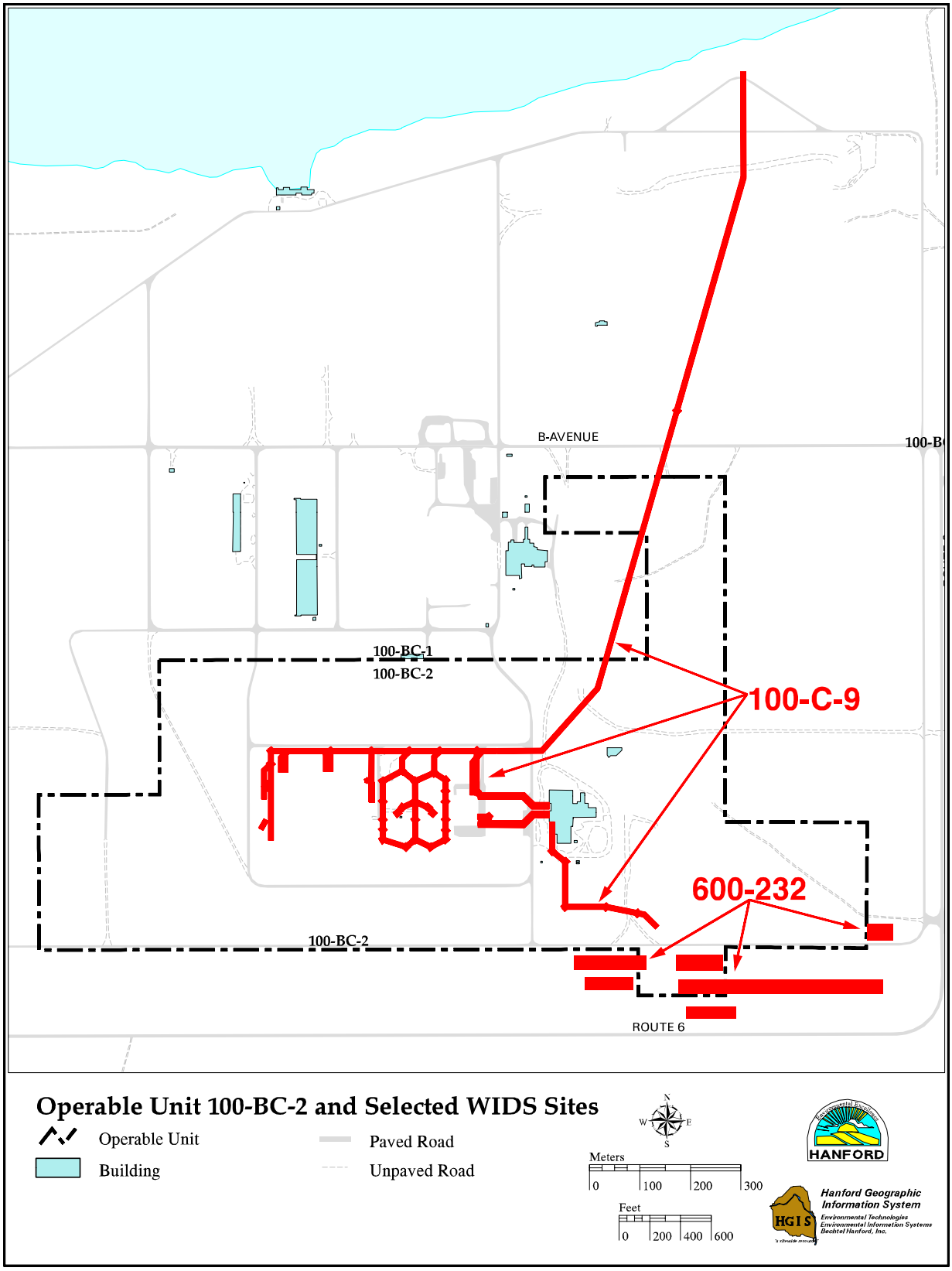

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Figure 1C. Location of the 100 Area Operable Units.

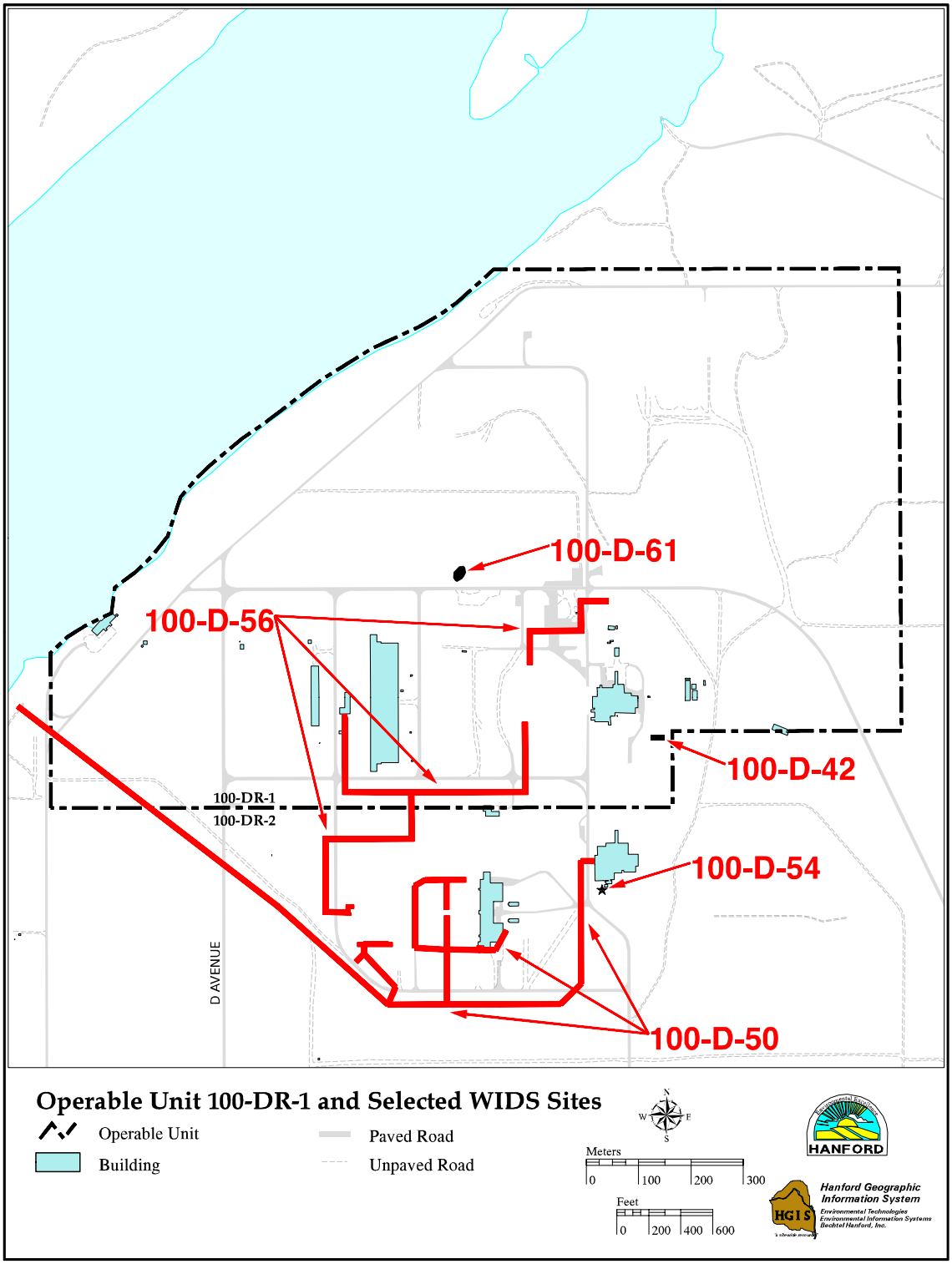

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Figure 1D. Location of the 100 Area Operable Units.

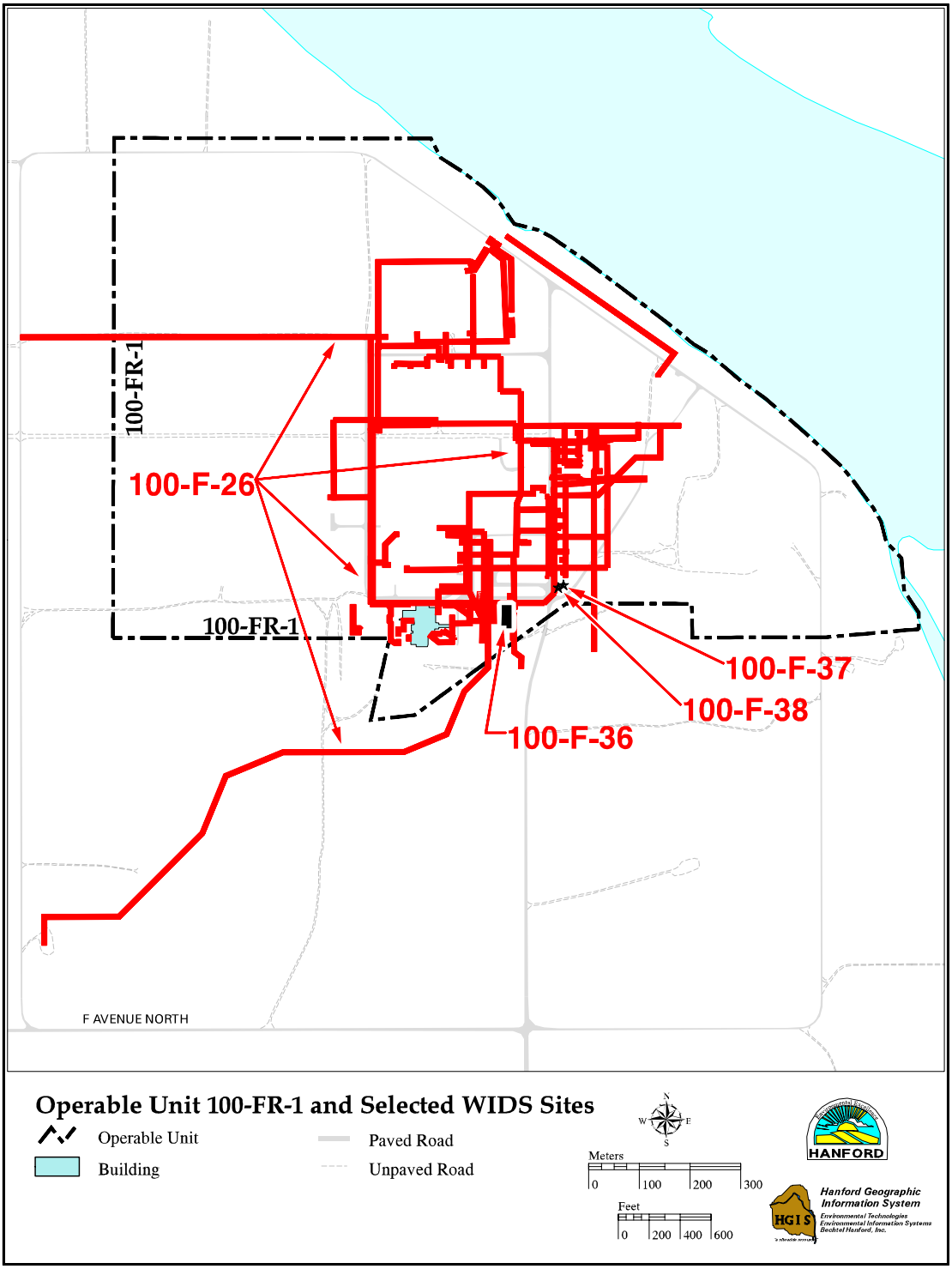

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Figure 1E. Location of the 100 Area Operable Units.

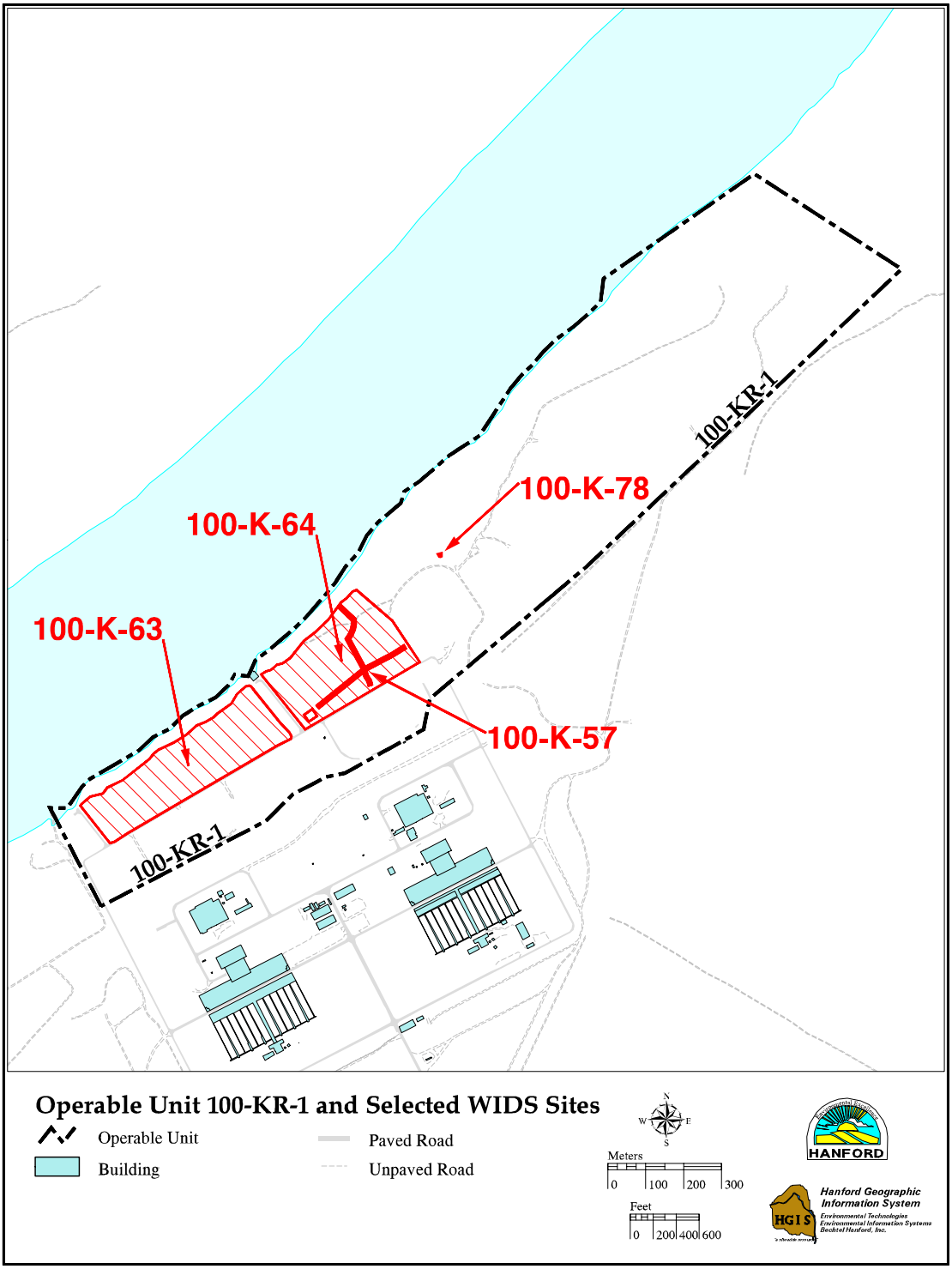

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Figure 1F. Location of the 100 Area Operable Units.

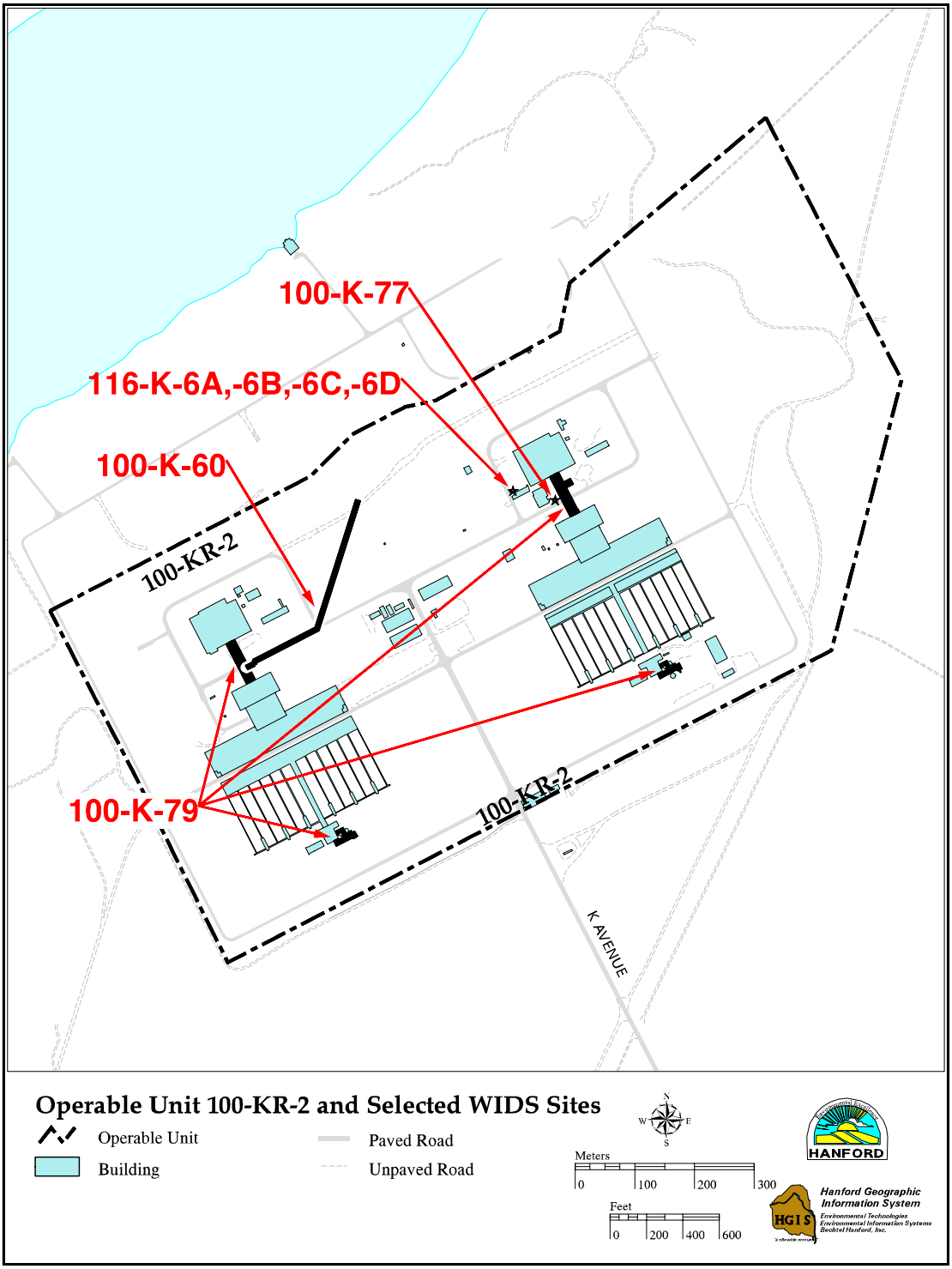

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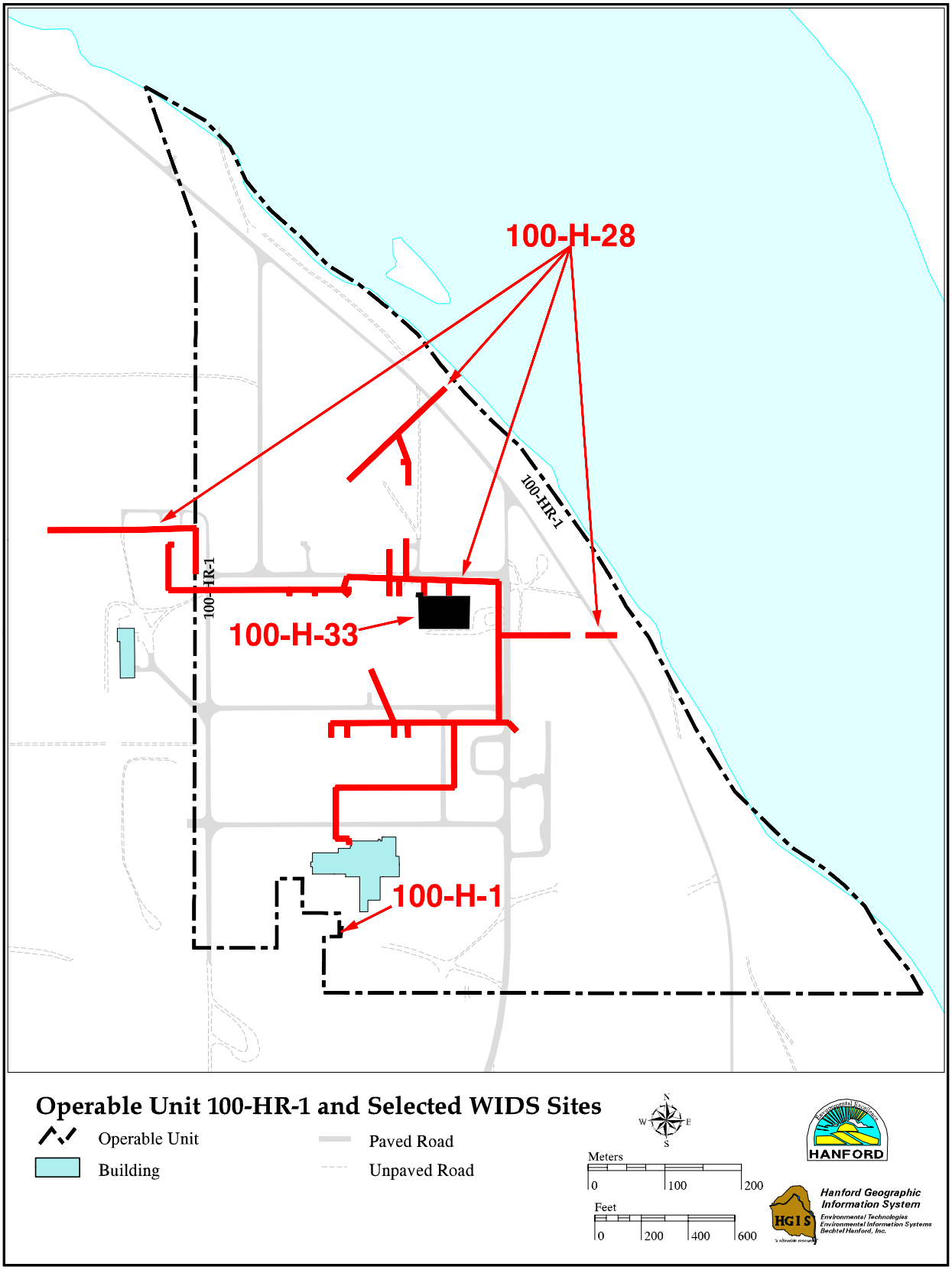
Figure 1G. Location of the 100 Area Operable Units.



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Signature sheet for the Explanation of Significant Differences to the Interim Remedial Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Mike Gearheard
Director, Office of Environmental Cleanup
United States Environmental Protection Agency, Region 10

2/9/04
Date

Signature sheet for the Explanation of Significant Differences to the Interim Remedial Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Keith Klein, Manager
Richland Operations Office
United States Department of Energy

4/26/07
Date

Signature sheet for the Explanation of Significant Differences to the Interim Remedial Action Record of Decision for the 100-BC-1, 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-FR-2, 100-HR-1, 100-HR-2, 100-KR-1, 100-KR-2, 100-IU-2, 100-IU-6, and 200-CW-3 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Michael Wilson
Program Manager, Nuclear Waste Program
Washington State Department of Ecology

3/31/04
Date

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
100-BC-1	100-B-11 (115-B/C Caisson Site, 115-BC Sump, 115-BC Drywell, 115-B Tank, 115-B/C Caisson Valve Pit)	Site of a former aboveground caisson that consisted of a steel pipe about 1.2 m (4 ft) in diameter and 1.5 m (5 ft) deep with a bottom and a steel plate over the top. Self-contained with no inlet or outlet piping. Located 60 m (197 ft) south-southeast of the 105-B Reactor building. Use unknown, but probably related to the 115-B/C Gas Recirculation Facility. Sodium dichromate contamination noted in caisson and soil during removal of structure.	Soil	Cr^{+6}	13,200
	100-B-16 (Utility Poles and Fixtures Debris Pile)	Two piles of debris from teardown of utility poles, including treated wood; lead-tipped bolts; dry transformers; and miscellaneous metal, wood, and wiring. Main pile located northwest of B Reactor. Second pile (poles only) located south of main pile. No sign of leakage at site.	Miscellaneous debris	Creosote, PCBs, Pb	26,200
	118-B-9 (104-B-1 Tritium Vault, 104-B-2 Tritium Laboratory)	Former site of two concrete masonry buildings that were used to extract, package, and store tritium gas produced at the B, H, and F Reactors. The buildings were decommissioned and demolished in 1996. The building foundations were removed to a depth of 1 m (3 ft) and the site was backfilled and graded to match the existing terrain.	Soil	H-3, Co-60, Cs-137, Eu-152/154, Sr-90, metals	43,800
100-BC-2	600-232 (100B Electrical Laydown Area)	Site of several utility poles in conditions ranging from good to poor. Treated wood ends cut off and stored nearby. Also, electrical utility materials such as steel cable, wire, aluminum beams, and poles. Tar observed in the area. Located 200 m (656 ft) south of C Reactor.	Wood and metal debris, soil	Creosote, PCBs	17,700
100-DR-1	100-D-42 (Buried VSR Thimble Site)	Consists of a solid waste burial ground that contains vertical safety rod (VSR) thimbles. Located east of the two reactor effluent pipelines in the 100-D Area.	Equipment	Mn-54, Co-60, Al, potassium borate	46,500
	100-D-61 (Utility Pole and Fixture Debris Piles)	Site of debris pile from the teardown of utility poles. Pile includes treated wood, lead-tipped bolts, and other debris. Located northeast of the 183-D Filter Building.	Wood and metal debris, soil	Pb, creosote, As, PCBs	26,200

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
100-DR-2	100-D-54 (Drywell Near Fire Facility Gravel Scrubber)	Consists of a 56-cm (28-in.) drywell constructed of concrete pipe with a steel cover. Approximately 1.5 m (4.9 ft) deep with a 5-cm (2-in.) pipe entering near the bottom. Located approximately 5.5 m (18 ft) southwest of the southwest corner of the 119-DR Sample Building. Use undetermined.	Concrete, steel, soil	Co-60, Cs-137, Eu-152/154, Sr-90, C-14, H-3, Th, U, Hg, ICP metals including Pb, Semi-VOAs and VOAS.	31,500
100-FR-1	100-F-36 (108-F Chemical Pump House, 108-F Biological Laboratory)	Site of a former chemical makeup facility, since demolished, that originally supported F Reactor operations and later served as a biological laboratory. Remaining structural elements include pieces of foundation at the southeast and southwest corners and the cast iron pipe associated with the 116-F-15 french drain.	Concrete and metal debris, soil	Asbestos, Pb, Pu-238, Sr-90, Co-60, Cs-137	35,900
	100-F-37 (French Drain Discovered Near Hydrant F-2)	Consists of a buried vitrified clay pipe containing reddish-brown rust-coated rocks. Located 235 m (760 ft) east-northeast of the 105-F Reactor building, north of hydrant F-2. Use unknown. Pipe removed during utility work, red-stained rock put back in place and covered. No radiological contamination found, but material scraped from rock showed lead and arsenic.	Rock, soil	Pb, As	12,800
	100-F-38 (Yellow-Stained Soil Near Hydrant F-2)	Consists of yellow-stained soil found during utility work, source unknown. Located near site 100-F-37. No radiological contamination found, but sample of stained soil showed lead and chromium.	Soil	Pb, Cr	13,000

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
100-HR-1	100-H-33 (183-H Solar Evaporation Basins Radionuclide Components)	Site of four former concrete basins with an area of about 2,452 m^2 (26,400 ft^2) that were demolished as part of a *Resource Conservation and Recovery Act of 1976* (RCRA) closure. Built originally as part of the 100-H water treatment system and later used to solar evaporate mixed waste shipped from the 300 Area fuel fabrication facilities. Located north of H Reactor and just north of the east 183-H Clearwell. Under RCRA closure, all detectable nonradiological contamination was removed, packaged, and disposed. RCRA closure did not address any radionuclides that were associated with the site. The contaminated concrete surface was scabbled and disposed. The remaining concrete was surveyed and the rubble placed in the adjacent 183-H Clearwells. Clean closure of the site was not achieved due to levels of fluoride and nitrate remaining in the soil below the excavated 6.1 m (20 ft) that are above *Model Toxics Control Act* (MTCA) Method B cleanup levels. Remedial measures included placing a vapor barrier at the bottom of the excavation; replacing the excavated soils with clean, compacted backfill; and groundwater monitoring.	Soil	Gross alpha, gross beta, U-234, U-235, Tc-99	40,000
100-KR-1	100-K-57 (107-KE Drainage Ditch)	Consists of a dry, shallow ditch that extends from the 116-K-3 (1904-K) Outfall Structure and the 116-K-1 Crib. A second ditch extends from the culvert to the Columbia River. The culvert conveyed process effluent leakage from the area surrounding the 107-KE Basins to the ditch. The two ditches intersect below the bank located just north of the basins. The ditch at the bottom of the bank is approximately 300 m (980 ft) long and 2 m (6.6 ft) wide; the ditch leading from the culvert to the river is approximately 270 m (890 ft) long, and the width is generally 2 m (6.6 ft) wide but widens significantly in the middle section.	Soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}	68,600
	100-K-63 (100-KW Contamination Area)	Site is along the Columbia River north of the 100-K West Reactor Area and 107-KW Retention Basins. It is posted as an Underground Radioactive Material Area, with two sections posted as Soil Contamination Areas due to surface and subsurface contamination as a result of leaks from the basins.	Soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}	46,400

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
	100-K-64 (100-KE Contamination Area)	Site is along Columbia River north of the 100-K East Reactor Area and 107-KE Retention Basins. It is posted as a Radiological Contamination Area, a Soil Contamination Area and an Underground Radioactive material Area, due to surface and subsurface contamination as a result of leaks from the basins.	Soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}	46,400
	100-K-78 (Fenced Contamination Area)	Site of an apparent unplanned release that resulted in soil contamination. Dimensions are 19.4 by 16.4 m (63.7 by 53.8 ft). Located northeast of the 116-K-1 Crib.	Soil	Co-60, Cs-137, Eu-152/154, Sr-90	38,600
100-KR-2	100-K-77 (Underground Railroad Ties Southeast of 1706-KE)	Site of railroad ties discovered at the bottom of an excavation about 7 m (23 ft) east-southeast of the 1706-KE Building. Excavation measured approximately 2.9 by 3.1 by 2.1 m deep (9.5 by 10 by 6.9 ft deep). The site was backfilled and the railroad ties at the bottom of the excavation were left in place, but the sidewall braces were probably removed prior to backfilling. Use unknown. Sampling for radionuclides and organics was conducted and no contamination was found.	Wood debris	Creosote	21,600
	116-KE-6A (1706-KE Condensate Collection Tank)	Site of a 363-L (96-gal) collection tank that received condensate from the 1706-KE evaporation unit, which was used to treat radioactive mixed wastes generated in the 1706-KE laboratories. This site is associated with the 1706-KE treatment, storage, and disposal (TSD) unit. The Tri-Parties agreed to conduct cleanup of this TSD unit using CERCLA, and the associated CERCLA documentation.	Debris, soil	Co-60, Cs-137, Eu-152/154, Sr-90, inorganics, and organics	50,600
	116-KE-6B (1706-KE Evaporation Tank)	Site of a 114-L (30-gal) evaporation tank that was used to treat radioactive mixed wastes generated in the 1706-KE laboratories. This site is associated with the 1706-KE treatment, storage, and disposal (TSD) unit. The Tri-Parties agreed to conduct cleanup of this TSD unit using CERCLA, and the associated CERCLA documentation.	Debris, soil	Co-60, Cs-137, Eu-152/154, Sr-90, inorganics, and organics	50,600

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
	116-KE-6C (1706-KE Waste Accumulation Tank)	Site of a 2,082-L (550-gal) tank that accumulated mixed wastes from the 1706-KE laboratories prior to ion exchange and treatment at the 1706-KE evaporation unit. This site is associated with the 1706-KE treatment, storage, and disposal (TSD) unit. The Tri-Parties agreed to conduct cleanup of this TSD unit using CERCLA, and the associated CERCLA documentation.	Debris, soil	Co-60, Cs-137, Eu-152/154, Sr-90, inorganics, and organics	54,400
	116-KE-6D (1706-KE Ion Exchange Column)	Site of a 0.14-m^3 (5-ft^3) mixed bed resin ion-exchange column used to treat mixed wastes from the 1706-KE laboratories prior treatment at the 1706-KE evaporation unit. This site is associated with the 1706-KE treatment, storage, and disposal (TSD) unit. The Tri-Parties agreed to conduct cleanup of this TSD unit using CERCLA, and the associated CERCLA documentation.	Debris, soil	Co-60, Cs-137, Eu-152/154, Sr-90, inorganics, and organics	11,800
Subtotal	**20**				**$695,900**
Additional Candidate Pipeline Sites					
100-BC-1	100-B-14 (100-B Area Process and Sanitary Sewer Underground Pipelines)	Consists of abandoned underground process sewers associated with 100-B Area operations, mostly north and west of B Reactor and joining to empty into the 116-B-7 Outfall. Also, the pipelines feeding the 1607-B7 septic systems, the sodium dichromate pipelines from the 108-B Building to the 190-B Building, and the treated water pipelines from the 190-B Building to B Reactor. Pipelines carried nonradioactive waste fluids, sodium dichromate, pre-reactor treated cooling water, and septage.	Pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	327,600
100-BC-2	100-C-9 (100-C Area Process and Sanitary Sewer Underground Pipelines)	Consists of abandoned underground process sewers associated with C Reactor operations, which join to form the 2,143-m (7.0-ft)-long, 46-cm (18-in.)-diameter cast iron process sewer that empties into the 1-C-2 Outfall. Also, the pipelines feeding the 1607-B8, 1607-B9, 1607-B-10, and 1607-B11 septic systems and the treated water pipelines from the 190-B Building to B Reactor. Pipelines carried nonradioactive waste fluids, pre-reactor treated cooling water, and septage.	Pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	242,500

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
100-DR-1	100-D-50 (100-DR Water Treatment Facilities Underground Pipelines)	Consists of abandoned underground pipelines that carried treated and untreated wastewater from the 183-DR Building, the 183-DR Clearwells, and 105-DR Reactor to the 100-D-8 Outfall. Reinforced concrete piping 0.3 m (12 in.) to 1.8 m (72 in.) in diameter. Located south of the above-listed buildings, generally running in an east-west direction. Pipelines carried nonradioactive waste fluids, pre-reactor treated cooling water, and septage.	Pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	114,800
	100-D-56 (100-D Area Sodium Dichromate Underground Supply Lines)	Consists of two abandoned 7.6-cm (3-in.) underground supply lines that carried concentrated sodium dichromate between the 108-D, 185-D, 189-D, 190-D, and 183-DR Buildings and the 100-D Sodium Dichromate Transfer Station.	Pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	114,800
100-FR-1	100-F-26 (100-F Water Treatment Facility Underground Pipelines)	Consists of the upstream (pre-reactor) process sewers associated with 100-F Area operations, including all underground water lines used to transport reactor cooling water between water treatment facilities and the 105-F Reactor building. Includes all underground lines running between buildings and those that run to drainage facilities and to the emergency cooling high tanks (water towers). Lines downstream from the reactor building (i.e., those lines that carried cooling water from the reactor to the retention basin, trench, and/or the river) are excluded. Also excluded are those underground lines associated with the Experimental Animal Farm. Pipelines carried nonradioactive waste fluids, sodium dichromate, and pre-reactor treated cooling water.	Steel and concrete pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	1,391,600
100-HR-1	100-H-28 (100-H Water Treatment Facilities Underground Pipelines)	Consists of the upstream (pre-reactor) process sewers associated with H Reactor, including all underground water lines used to transport reactor cooling water between water treatment facilities and the 105-H Reactor building. Includes all contaminated underground lines running between buildings and those that run to drainage facilities. Lines downstream from the reactor building (i.e., those lines that carried cooling water from the reactor to the retention basin, trench, and/or the river) are excluded. Pipelines carried nonradioactive sodium dichromate process wastes and pre-reactor treated cooling water.	Steel piping, concrete, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	75,500

Attachment 1. Additional Candidate Sites. (6 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media/ Material	Potential Contaminants	Estimated Sampling Cost ($)[a]
100-KR-2	100-K-60 (1904-K Process Sewer [165-KW])	Consists of the 1.68-m (66-in.) concrete process sewer that begins at 165-KW and runs up to the point of intersection with the pipelines coming from the 105-KW Reactor building. Does not include the radioactive process sewer pipelines, water supply lines, or glycol heat pipelines or site 100-K-47. Used to dispose of treated and untreated wastewater generated by the water treatment facilities and powerhouse.	Concrete pipelines, pipe residue, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, metals, Pb	45,900
	100-K-79 (Sodium Dichromate and Sulfuric Acid Product Pipelines at 100-K)	Consists of the following: sodium dichromate product pipelines from the railroad offloading area to the dichromate storage tanks and then to the 183-KE and 183-KW Buildings; the sulfuric acid product pipelines from the acid storage tanks to the 183 buildings; and the treated water pipelines from the 165 Power Control Buildings to the 105-KE and 105-KW Reactor buildings. Mostly encased in tunnels except for areas where offloaded from railroad cars. No recorded releases.	Pipelines, soil	Co-60, Cs-137, Eu-152/154, Sr-90, Cr^{+6}, Cr, Hg, metals, Pb	45,900
Subtotal	**8**				**$2,358,600**
Total	**28**				**$3,054,500**

[a]Costs were estimated using the Microsoft® Excel spreadsheet model presented in *Remedy Selection Process for Remaining Source Operable Unit Waste Sites* (DOE/RL-94-61, Appendix N, Rev. 0, October 1989), updated to reflect current practices.